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# SYNCHRO SETTE



THE SUBSCRIPTION MAGAZINE FOR  
THE T/S-1000 and THE ZX-81 MICROCOMPUTERS

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THE SUBSCRIPTION MAGAZINE FOR THE ZX-81 MICROCOMPUTER

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## EDITOR RAMBLINGS - CONT.

### KOPAK PRESS RELEASES

Having trouble hitting the right keys while watching the screen? Kopak Creations, Inc. has just introduced the Touch-a-Matic. This device is a Keyboard overlay that fixes to the ZX-81 keyboard. 3/8" holes guide your fingers to the proper key positions. Touch typists will appreciate the freedom of not having to look at the keyboard. Although not as fast as performance on a standard keyboard, it gives the user a pleasant compromise.

One was sent for my review and I must say I immediately was able to appreciate the difference. It is priced at 9.95.

In a phone conversation with a Kopak rep., I was told that we can expect in the near future a ZX-81 interface device that will allow hookup to commonly available

parallel port printers. Radio Shack has an 80 column, 5 by 7 dot matrix, tractor feed printer with upper/lower case and graphics (not ZX-81 graphics code) capability for \$399. Kopak plans to include the character code converter with their interface.

This means you can use your ZX-81 or T/S-1000 to print letters or anything else you desire on regular commonly available fan-fold paper. No price was quoted, but my guess is under \$100.

Kopak has a whole line of available software and books. For further information call or write:

KOPAK CREATIONS INC.  
448 W. 55TH ST.  
NEW YORK, NY, 10019  
(212) 757-8698

Tell 'em SYNCHRO-SETTE sent you!



# THIS MONTH'S CASSETTE PROGRAMS



Where is my Synchro-Sette?

**SYNCHRO-SETTE** cassette tape programs for August, 1982

Each program is recorded twice.

Adjust recorder volume to proper level.

Not all tapes load at same volume. If program name is followed by <SL>, this means the program is self loading and you won't have to type in RUN.

Programs will, of course, still load with the format, LOAD ..

If you have loading problems, consult the following previous issues of **SYNCHRO-SETTE** for articles on this subject:

April/82 ----- page 14

May/82 ----- page 14

July/82 ----- page 3

Also, Sinclair will mail to you, a list of suggestions on overcoming cassette loading and saving problems.

Programs that create their own data files automatically will change the last character of the data file name into an

inverse character.

<LT> after the program is the loading time. This can help you locate a program a little easier. If your recorder has a counter, it is a good idea to write down on a piece of paper for future reference, the location of each program on the tape. We cannot do this because there are so many different recorders on the market and the counters are not synchronized to each other, even among the same models.

Programs that create their own data files automatically will change the last character of the data file name into an inverse character; when you reload it by name, you must type in the last character this way.

---

1K side - 44 second leader:

"LOADER-1K" <SL>, LT - :14

This program provides a MENU that allows the user to enter a number and then the requested program will be searched for and loaded. If it is a self-running program, it will automatically run.

You will notice that you

cannot BREAK this program in the normal fashion to observe the LISTing. This is one example of how a software author might protect his program from being copied. If you want to observe the LISTing, I'll give you a hint:

Enter the following code into the "CIPHER" program that was on the June/82 cassette, 16K side.

746259594657735758704657735748  
5541586038577550455955

The keyword clue is:

WHAT IS A GROUP OF COLTS CALLED?

Source - The Book of Lists.

1 - "MESSAGE" (SL), LT - :10

This is a Marquee-type program but with a vertical scroll. You can enter your own messages by changing line 100 to INPUT A\$. If you wish to save the message on tape, use the original format of line 100 with your own message. Set up your tape in the recorder and then enter GOTO 300. The program will be saved with the name being "MESSAGE" (last E is inverse). 1K machines are limited to about 75 characters.

For converted ZX-80s, add line # 225 PAUSE 50.

2 - "ARTIST" (SL), LT - :21

Probably the best 1K program I've ever seen written in BASIC. Patterned after other ETCH-A-SKETCH type programs, this one not only allows the user to draw pictures on the screen, but also to erase unwanted areas with ease (once you've practiced enough). You can also clear the screen and start fresh, and get this, you can save the pictures on tape and recall them later and start where you left off!

Think of the practical applications of this program other than as a child's drawing board. Draw pictures of room additions or house plans, of circuit designs, street maps of towns, hobby or home projects in 3 dimensional perspective. The list is endless.

And of course, you needn't worry about completing it in one sitting because you can always file the picture on tape and recall it at a later date.

If you have a printer, it is possible to re-write the program to print the picture on paper.

This program loads with a picture appearing on the screen of a locomotive with an "ET" type character sitting at the controls giving you a friendly greeting. This is a picture I drew with this program.

Press the (D) key. This puts you in the DRAW mode. You will see the cursor blinking at the top of the exclamation point. If you wish to move the cursor, press one of the arrow keys (5,6,7 or 8). This will make the cursor move in the direction of the arrow and leave a black line trail behind it.

Press the (E) key and the cursor disappears. You are now in the ERASE mode. You can't see the cursor unless by the trail it leaves through a blacked-out area. Use this mode to erase unwanted black areas. It can be moved with the arrow keys.

If you feel lost without the cursor, enter the following line:

```
74 PRINT AT 0,26;"X = ";X;" ";  
AT 1,26;"Y = ";Y;" ";
```

This will allow you to know the screen coordinates of the cursor, as outlined on page 89 of the Sinclair manual. You will notice that with this line in



the program, the input time is greatly increased, making the program operate much slower.

Try practicing adding a coal car onto the locomotive. End by bringing the blinking cursor into ET's head to make his mouth appear to move. A 1K machine may run out of memory but it still can contain quite a bit of graphics.

Don't worry about an error occurring if the cursor reaches the end of the screen. There is a built-in routine that will prevent the cursor from going too far. This is helpful for drawing screen borders.

If you want to clear the screen and start all over, press <C> and if the cursor is in the DRAW mode, you will see it blinking at its last location.

If you have a picture completed or have no more time to work on it and want to save it, press <S>. This will put you in the SAVE mode and the <L> cursor will appear at the bottom left of the screen. Now type in the name you wish to call the picture. Put your data cassette into your recorder and advance it beyond the tape leader. Have the recorder in the RECORDING mode and press enter on the computer. Your picture will now be saved and can be recalled by the name you called it; when it is loaded, it will come up running.

How's that for sophistication in only 1K of memory.

Unfortunately for owners of converted ZX-80s, the program depends so heavily on the INKEY\$ command that it loses its effectiveness for that machine if PAUSE routines are introduced.

I would be interested in seeing any interesting pictures

that anyone would like to submit. I could put some of the more interesting ones in our next tape issue. If you would like to send us one or more, please write them in 1K with the 16K module disconnected from the computer. Use an inexpensive cassette because we cannot return them, but you will have the glory of seeing your name in print and the other subscribers will witness your creativity.

### 3 - "LABYRINTH", LT - :18

At first glance this game is not very eye-appealing but as the left side of the screen fills up with a graphic maze that moves from the bottom to the top of the screen, you start to see the pitfalls that await the squot (graphic character at the top of the screen) that you control by making it move left or right with the <I> and <O> keys.

The idea is not to let the squot hit any of the graphic blocks or the walls of the labyrinth (no fair going outside the walls). If it does, your final score is the number at the upper right of the screen.

As long as nothing is hit, the game just keeps going on forever.

The computer is sneaky though and sets up traps that at first appear to allow the squot to travel through but then end in a dead end. Since there is no backtracking, the game is soon over.

For a 1K game, it gives quite a challenge.

### 4 - "MULTIPLY", LT - :09

Ever hear about program routines that allow more than 8 digits of accuracy in a mathematical operation. With the

first TRS-80, only six digits of accuracy were allowed. This meant that with business program that correlated money amounts, the maximum correct amount that would show all the digits was \$9,999.99.

The first Apples with integer basic were even worse in that the digits to the right of the decimal point were lost completely.

The ZX-81 however allows accuracy up to \$999,999.99 with normal programming methods. This can be expanded to an almost unlimited amount.

This program allows the input of 2 numbers. When you see the (L) cursor at the bottom of the screen, you can enter a number of any length that the computer's memory will allow. After you enter this number the cursor will appear again. Now enter a single digit number.

The computer will then give you the correct answer to as many digits as the answer requires. Both numbers must be whole numbers. The routine will ignore any decimal point.

Using this routine as a base, what would be required to allow the second number to be more than one digit in length? Try to expand this program to allow the second number to be at least 9 digits long. I haven't had time to work out the answer yet and would appreciate any help. If you come up with one, send it to me and we'll publish it.

Also, how about similar routines for division addition and subtraction.

5 - "CHAR-CODE", LT - :09

This program scrolls the ZX-81 character codes on the screen with their corresponding number.

For more information, turn to page 137 of the Sinclair manual.

16K side - 38 second loader:

"LOADER-16K" - SL, LT - :18

Performs the same function as the 1K loader but for the 16K programs. This program will load on 1K machines but will not load any of the programs in its directory.

1 - "BULLETIN" (SL), LT - 1:32

Our bulletin board program - total message time, 4 minutes and 50 seconds.

Remember MARQUEE-2? How about a double marquee program that you can put your own messages into and save on tape; then when it's recalled, the program starts running by itself?

We intend to use this program to bring you the latest information about the Sinclair products, new products and services and Users' Group information, and of course to try to sell our wares.

After the fascination of watching this program run wears off (2 to 3 hours), you may want to enter your own messages. There are two ways to do this. BREAK the program and enter these 5 lines:

```
5 LET B = 0
6 LET O = 1
7 LET L = 0
10 INPUT A$
20 INPUT B$
30 LET C$ = ""
```

Now RUN the program. Enter the message you want to appear in the first window. Then enter the message you want to appear



in the second window. After the second message is entered, the marquee will begin. Pretty neat, huh?

To save the program with your message, press the BREAK key, then type in GOTO 1000. Put the data cassette in the recorder. Put the recorder in the recording mode and advance the leader. Now press enter on the computer. The program will be saved under the name of "BULLETIN".

If you want to change the name to something else, type in the following lines:

```
1000 INPUT M$
1005 SAVE M$
```

Now repeat the GOTO 1000 procedure which, when executed, will show the (L) cursor on the bottom of the screen. Enter the name you want the program to be called. CAUTION - when you press the ENTER key, the computer will start saving the program, so make sure the recorder is ready.

The other method of data entry involves a procedure I use when I have long messages to enter.

Have you ever entered a long string of data from a single INPUT command and after the first few lines were entered, you became annoyed at the amount of time it took after each character key was pressed because the screen kept refreshing?

Try this little trick in this program. Enter the following line:

```
10 LET A$ = " type in about 2
   lines of text in here "
12 LET A$ = A$ + " type in 2
   more lines of text "
14 LET A$ = A$ + " Keep
```

```
repeating this procedure
until you have entered all
the text you want to enter "
20 LET B$ = " type in 2 lines
   of text for second message "
22 LET B$ = B$ + "same
procedure
as in above format"
```

When you RUN the program now, the old variables on the left side of the (=) sign keep getting the message to the right tacked on as to increase the size and include the new information.

This not only speeds up data entry but also makes it much easier to EDIT in case of an input error.

Let's say that the lower case words that appear in the above lines were the ones that were actually typed in. Let's also say that you forgot to put a period at the end of line 20 and line 20 had 2 lines of text. It would take a long time to move the edit cursor all the way to that position and enter a period.

There is a much faster way. Enter the following line:

```
21 LET B$ = B$ + " ,"
```

Simple, huh?

But how about if you wanted to remove something at the end of a line such as the last 2 words in line 14, " -- TO ENTER"? How many total spaces do these words occupy? Eight, right? Don't forget the null space. Type in the following line:

```
15 LET B$ = B$(1 TO LEN B$ - 8)
```

If you want to add a period to the end of that sentence, change line 15 to read:

```
15 LET B$ = B$(1 TO LEN B$ - 8) +
  ,"
```

The last 8 characters were stripped off and the period was added on.

See, the COMPUTER TUTOR isn't the only one who knows how to teach.

After you have entered all the data, RUN the program to see how it looks. If you like what you see and you want to save the message on tape, BREAK the program and set up the data tape in the recorder and type in GOTO 1000.

If you listed the original program, you will see that there is no data message in the lines above 75 in the listing or anywhere else in the program. How was this accomplished?

Easy, the following line, <72 STOP> was added and the program was RUN. The program then RUNS until it encounters the STOP command and then BREAKs. I now deleted all the lines before and including line 72. I then entered GOTO 1000 and all the variables were kept intact and the program was SAVED in the running mode.

If you try this, remember the inverse last character when the program is recalled.

Use these techniques in programs you write and before you know it, I will be buying programs from you.

2 - "BAR-GEN" <SL>, LT - 1:07

Ever see those neat graphing programs on other computers and wish you had one of your own?

Now you can put to shame all your friends with their more expensive computers.

- This is a bar graph generating program that is MENU driven and has the capability to store 120 data entries on tape

for recall at a later time, 120 entries would correspond with 10 years of monthly sales for a business but it can also be used to chart your weight on a daily, weekly or monthly basis or a teacher could use it to analyze daily class attendance. A weatherman could enter daily rainfall or temperatures. Stock prices, gold or silver fluctuations, commodities costs, etc. are just a few of the items that can be analyzed with this program.

The bar graph has long been a useful tool for the person who wishes to observe a perspective that is normally invisible on a day to day basis.

It is simplicity itself to use. The MENU allows you three choices:

#1 - asks for a TITLE. This will be used later in both the bar graph display and as the FILE NAME when the data is saved. After you enter a title, enter the data items one by one as the program asks for them. When you have no more data to enter, enter a <0> and the program will revert back to the MENU.

#2 - allows you to see the data in the form of graphic bars drawn from left to right and scrolled from the bottom of the screen. To the left of the bars are the data items and the order in which they were entered. The program will automatically take the largest data item entered and give it the maximum bar length. All other data item bars will be proportional in length to the longest bar.

The bars will continue to scroll until the last one is displayed and then the screen will freeze until you press the ENTER key. The program then returns to the MENU.

If you have more items to



enter into a file that already exists, just go to #1 from the MENU and the program will allow the next entry to correlate with the next available position.

#3 - is to save the data on cassette. It lists instructions for saving, and after, returns to the MENU. To exit the program, press the (P) key.

When the data file is recalled, recall it with the name of the file you gave it or use LOAD ". The program will come up running and the data will be just as you left it.

See the article this month called IMPACT on sample data that can be entered into this program regarding the Sinclair computer product's impact on the U.S. market.

### 3 - "NAME/ADD", LT - 2:48

They said it couldn't be done and maybe it couldn't. Well, here it is, anyway.

The presence of only 26 string variables in the ZX-81 ROM makes it extremely difficult to write a program that will allow the user to input any amount of character information, such as in a name and address program.

In the Computer Tutor article of June/82 on page 9, we discussed the potential of converting string variables into numeric variables and then back into string variables again.

This process worked fine, but only as long as the string did not exceed four characters in length. Well, anyone knows that the average name is over 4 characters in length.

The old professor put forth a challenge to you people out there to use his format to write

a program that would allow at least eight characters of input per item. So far no one has come forth with the correct answer.

Therefore, he decided to show us all that it could be done and wrote a program that allows the following inputs:

Last Name	- 12 char. max.
First Name	- 12 char. max.
Address	- 16 char. max.
City or Town	- 12 char. max.
Zip Code	- 8 char. max.
State	- 4 char. max.
Phone #	- 12 char. max.

Before using the program, change line 5 to let 0 be a value of less than the 95 that is there unless you have more than 16K of memory.

The number you put in will represent the maximum amount of names that can be entered into the program data file. The larger the number, the slower the program will operate and the more of a chance you will have of running out of memory. Experiment with 25 or 50 and see what happens.

Also change line 6610 to read - LET S(N) = B(1) - the editing of the state will not work correctly unless this is done.

You can, of course, use the program to create as many data files as you want on tape, so there really is no limit to the amount of inputs you can have - only to the amount of cassettes you own.

There are easier and faster ways of writing this type of program, which is not always the objective of the old professor.

What he wanted to show you is that it could be done and for all the programming techniques this program uses, it is really a work of art. If you list the program and compare some of the routines with the context of

that article, you will see the similarities.

This program, by changing the value of the variable in the first line, can push the memory that is being used to the limit, and may behave in an erratic fashion with a lot of OUT OF MEMORY errors, so keep this in mind when using it.

Although the program as loaded is not self running, it can create data files that, when recalled, come up running. The program MENU is explained as follows:

#1 - To Enter Or Add To A File is pretty much self-explanatory. If you have no more to enter, just press the ENTER key. The number of the entry is always displayed so that you can know how close you are coming to the limit.

#2 - This routine allows you to look at any one name in the file. If you want to change any of the data items, the routine will branch to the EDIT mode. Only one item may be edited at a time. If you have more than one, you have to go back to the MENU and start over again. The secret is not to make too many mistakes and hope not too many of your acquaintances will be moving.

#3 - If you wish to save a file, prepare to have a lot of tape available on your cassette. The reason we did not have this program self-loading is because with 95 entries (which it couldn't handle, anyway), it would take twice as long to load.

This routine is self-prompting and will tell you to do what is necessary. If you are adding on to an existing file and it already has a file name, press enter when requested, and the old name will be used.

#4 - This command wipes out all the data in the file registers and allows you to begin a new file.

This is useful if you just saved one file and wanted to begin another one.

#5 - executes the STOP command and allows you to exit the program.

I plan to have a version available next month for sale and have already contracted the professor to write it for me. It will allow a lot more input in 16K, operate faster and be designed to print out on MINDWARE's new printer that uses standard adding machine paper tape.

The idea, of course, being that you will be able to print out formatted labels that you can cut apart with a pair of scissors and glue onto envelopes.

At last a practical use for your toy that you can explain to your wife to try to convince her that you really got it to be a help for her. Tell her that she can use it for her Christmas list and she will never have to write or type an address on an envelope again (when she excitedly demands that you get it, we might have our PRO FOOTBALL PICKS program ready to order at the same time for you-know-who).

#5 - "STAR-LANDER", LT - :56

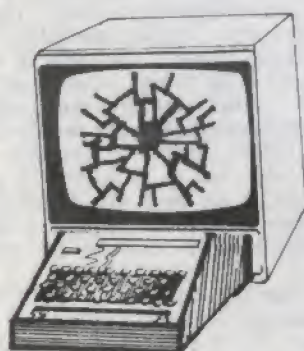
This program was submitted by one of your fellow subscribers, Mr. Kenneth Duda of Northlake, IL.

Mr. Duda explains "It starts off with a background of space and stars, your space capsule (A), a flashing prompt (INPUT THRUST) and a small screen

(cont. on page 13)



# IMPACT



## THE IMPACT OF SINCLAIR COMPUTER PRODUCTS ON THE U.S. MARKET

Sales of desktop computers in 1981 were approximately 2 billion dollars in the United States. Of this amount, the largest share of 21% went to Apple Computer. The breakdown is as follows:

1 - APPLE	420 M	-	21%
2 - TANDY	400 M	-	20%
3 - COMMODORE	240 M	-	12%
4 - ATARI	200 M	-	10%
5 - IBM	140 M	-	7%
6 - TEXAS INST.	120 M	-	6%
7 - ALL OTHERS	480 M	-	24%

(M = millions of dollars)

Sinclair's sales were roughly 25 million in the U.S. in 1981 which would represent roughly 3/4 of one percent of the market.

The projected market for future years of sales in the U.S. of desktop computers is as follows:

1982	- \$3,200,000,000
1983	- 6,300,000,000
1984	- 9,500,000,000
1985	- 12,600,000,000

If these figures in any way resemble actual future sales, we ought to see a doubling of the industry in the next 12 months.

The type of buyer of desktop computers is reflected in the following figures which represent units sold in thousands:

	81	82	83	84	85
Bus. -	317	620	1109	1630	2850
Home -	143	340	627	930	1150
Scient.-	37	54	66	76	82
Educ.-	87	115	136	158	181

Now, enter the BAR-GEN program into your computer and enter the first set of the seven percentage (%) figures into the computer. Return to the menu and exercise option #2.

You now see the bar graph for the six companies and the remainder. Return to the menu and exercise option #1 and re-enter the title.

Hint - to keep from re-entering the title each time if it is going to be the same, change line #1020 to read:

```
1020 IF P% = "" THEN LET P% =
```

and enter the following lines:

```
1015 INPUT P$
1025 LET T$ = P$
```

Now enter for the eighth item, the number (.75) which represents Sinclair's projected portion of 3/4 of one percent of the market.

As you can see, there is no noticable impact on the U.S. market for 1981.

Sinclair has sold at least a quarter of a million ZX-81s since the beginning of this year to mid-year, so, using this as a low end figure, we can reach the following approximations. About 150,000 ZX-81s were sold for \$150 each. This represents 22.5 million dollars. Another 100,000 have sold for \$100 each. This represents another 10 million dollars. About half of the purchasers bought the 16K RAM pack. 75,000 at \$100 each and 50,000 at \$50 each. This represents another 10 million dollars. Software sales roughly accounted for 2.5 million dollars. This represents a total of 45 million dollars for the first six months and if the sales were the same for the last half of the year through Timex, we would see 90 million in total sales for the year. This would represent 2.8% of the 1982 projected market. If the other companies held close to the previous rates they enjoyed, the Timex/Sinclair computers now have made a healthy dent in the market.

Let us assume at this point that the other manufacturers will remain stagnant in their positions in this graph chart. Return to option #1 and enter as item #9 the number (2.8).

Actually, the computer chops off everything to the right of the decimal point so it treats (.75) as (0) and (2.8) as 2. But even so, we can see that T/S is

now on the map.

In reality, the last quarter of this year should show an increase of sales that should far surpass the total sales of the first three quarters.

The ZX-81 has been sold only by mail-order so far. Timex plans to spend roughly 50 million dollars or 25% of its advertising budget promoting the T/S 1000 next year. The computers are already being sold in stores. Macy's in New York is selling them as of August 10 and I received mine a day later (shows how late I get this magazine out).

Timex has over 100,000 outlets in the U.S. The word is that they will be sold from all the major department and other stores such as Sears, Montgomery Wards, J.C. Penney's, Wallgreen's, K-Mart, etc. Compare this with the ten thousand or so Radio Shack outlets or the amount of outlets selling the other computers and you begin to see the perspective of the picture. Unofficial sources expect Timex to market between 6 to 9 MILLION units in 1983. Couple that with the roughly 58% of the market also buying 16K RAM packs, the software and add-on peripherals and you have an astronomical figure of 1.2 to 1.8 BILLION dollars in sales for that year. This represents about 27% of the 1983 market and, of course, some or all of the other companies may have their share decrease dramatically.

In mode #1, enter item #10 as (27).

If these figures are anywhere in the ballpark, the impact will be phenomenal, as you can see by the chart - and this does not even take into account sales of the SPECTRUM computer, which Timex has plans to pursue.



The T/S-1000 is packaged better than the ZX-81 was and comes with a demonstration tape that has 3 - 2K programs on it, one of them in machine language.

Software support will include 21 programs initially, of which about 12 are available now, including Vu-Calc, a Visa-Calc type program. We hope to have reviews on some of these programs in our next issue. - (Ed. note - see EDITOR RAMBLINGS for a complete listing).

Schools are taking a hard look at their budgets and wondering whether they should buy 1 - 16K Apple or 7 - 16K T/S-1000s or should they wait and get 5 SPECTRUMs for the same price.

At this time, I am not aware of Apple, in the near future, coming out with a low end computer of any kind to compete with either the T/S-1000 or the SPECTRUM.

Tandy has their pocket computers, of course, and reliable sources tell me that an interface chip is being developed to allow video output to a standard TV set. Whether they will pursue the low-end market that Sinclair has developed remains to be seen.

Commodore, with the introduction of the VIC-20 and the recently developed MAX computer, seems to be the only serious contender to the ZX-81, TS-1000 and the SPECTRUM.

The T/S-1000, like the ZX-81, is not without problems. I received two of these computers and one didn't work. The keyboard did not respond at all. Timex, however, will probably have many more U.S. service centers than Sinclair does.

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## CASSETTES - CONT.

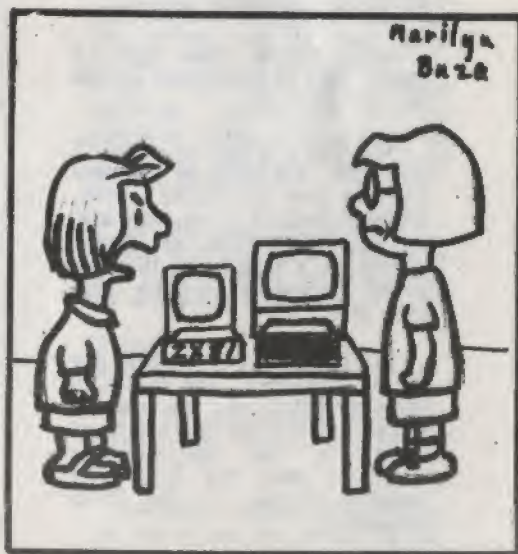
showing (F) for fuel, (H) for height and (V) for velocity.

As the capsule descends, more stars appear, giving the illusion of moving through space.

Start out by giving the ship (0) thrust to bring it down near the landing platform, but watch your height gauge as well as the velocity.

When you get about 50 feet or so, start giving it thrust - too much and you start to balloon up. It might seem like a simple game, but it will fool you. The game ends with a safe landing, showing how many points you made it in or it may show that you (CRASHED AT XX FEET)\*.

Well done, Ken.



My Home Computer  
can beat your home  
computer!

# *the Computer Tutor*



## SYNTACTIC SUM

Good morning class. This month's discussion regards the ubiquitous phrase, SYNTACTIC SUM.

You might have seen this phrase in other publications and wondered what it meant. I see the heads nodding in approval.

Does anyone know what it means? Yes, the gentleman in the back of the room.

No, that's wrong. It doesn't mean the sum total of how many times we have tactically sinned, although that is close. Nor does it mean the total of syntax errors in a program or the size of the program or anything else like that.

The number that follows the phrase SYNTACTIC SUM refers to the sum total of the numeric values of all the character set codes in the RAM memory locations when the program in question resides in the ZX-81 computer.

The gentleman in the rear asks what the heck is that good for. Well, I'll tell you:

Have you ever typed in a

program and found it didn't work? You probably wondered if it was a mistake that you typed in or a mistake in the actual listing of the program.

If the SYNTACTIC SUM was available for that program, you could add up all the values in the RAM locations and compare the total to the SYNTACTIC SUM total, which is what it should be.

If they are the same, the program is probably entered correctly. If they're not, start looking for errors in the listing.

"How do we know which RAM locations to check?" asks the man in the back. Well, the program listing starts in RAM location 16513. Enter the following line:

10 REM

Now enter PRINT PEEK 16513. The computer responds with the number 234 and if you look on page 141 of the Sinclair manual, you will see that 234 is the character code for the command REM.



If we enter PRINT PEEK 16512, the computer responds with the number 0. This does not, however, correspond with the 0 in the line number 10 in the listing. To prove this, delete line 10 and enter the line - 9 REM.

Now enter PRINT PEEK 16512. The computer still responds with the number 0. We now know that RAM memory location 16512 (and all the locations lower than that number) does not correlate with the listed program but that location 16513 has the character code of the first item after the first line number of the program.

If our only program line was - 10 REM A - and we PEEKed the next RAM location after 16513, which of course is 16514, we would find the number 38, which is the character code for the letter (A).

Each time we add another character to the end of the line, the next available RAM location picks up the character code. However, when we enter another line number, the RAM locations start picking up all sorts of strange character code numbers, which may or may not correlate with what we see in the actual listing, but we won't get into the mechanics of that now.

If a program is entered properly and we were to add up all the character codes up to the last item listed, the total should be the same, whether it is done on your computer, my computer, or anyone else's computer. This way we have, so to speak, a common method of checking our spelling, but we have not as of yet, the tool to accomplish this task. Does anyone have an idea on how it can be done? Yes, the hand in the back again?

OK, the gentleman says all we

have to do is to write a routine that would be part of the program and that would add up all of the character codes from the first memory location, 16513, to the last available location in memory, depending on whether it was a 1K or 16K machine, and then subtract the character code total of the routine itself.

Wrong again, Sir.

At first glance, this method seems like it would work. The problem is that this type of routine looks at the RAM locations AFTER the PROGRAM and adds their values too. The values that reside in memory locations not used by the program may be random values. Enter the following program and RUN it:

```
10 LET N = 16513
20 SCROLL
30 PRINT N; " - "; PEEK N; " - "
  CHR$ PEEK N
40 LET N = N + 1
50 GOTO 20
```

This program is actually a mini-machine language monitor and allows you to see three columns of information. The first is the RAM memory location, the second is the character code, and the third is the actual character being held in that location.

In the running mode, the scroll occurs pretty fast, so to turn control over to you, add the following lines:

```
35 INPUT A$
36 IF A$ = "P" THEN STOP
```

Now RUN the program again and advance the SCROLL by pressing the ENTER Key.

See what I mean? At first you can easily see characters in the third column that correspond to the program items. No line numbers are observed, unless

they are following GOTO (or GOSUB) commands. After the program has SCROLLED beyond its last memory location, you start to see the stuff that inhabits the unused RAM memory locations. Kinda gives you an idea what the movie TRON is all about. These memory location values are what we programmers technically refer to as "junk".

For many of you, this will probably be your first introduction to machine-language.

No, as usual, the answer submitted by the gentleman in the rear won't work. What we need is to find the last location of the program. There are routines that do that, but depend on knowing how much RAM the computer has. We want a routine that will work on the ZX-81 and not have to worry about how much RAM the machine has. Here is a routine that accomplishes that objective:

```
9992 REM COPY COPY
      (COPY is command)
9993 LET N = 16513
9994 LET X = 0
9995 LET Z = PEEK N
      + PEEK (N + 1)
9996 IF Z = 510 THEN
      PRINT X - 234
9997 LET X = X + PEEK N
9998 LET N = N + 1
9999 GOTO 9995
```

If you enter this routine by itself and RUN it, it will give a total of 0. The man in the back is wildly waving his hand. Yes, what is it?

Oh, yes, line 9992 - the computer does not allow the command COPY to appear after REM. Good point.

Here's how you do it. After you have entered (9992), enter the command (COPY). Now backspace with the arrow key (shift 5) and enter (COPY) again. Put in the (REM) command

the same way.

The purpose of the two (COPY) commands in line 9992 is to provide a situation that would not occur in a normal program.

The character code for (COPY) is 255 and lines 9995 and 9996 search for two adjacent memory locations containing 255 in each of them. If this situation is encountered, the sum of all the character codes before the first of these two locations, less the amount of 234, which represents the character code of the (REM) command that precedes the first RAM memory location that has 255 in it, is displayed.

This is the SYNTACTIC SUM, and once it is displayed you can now BREAK the program. Again, this routine will work no matter what size memory you have in your computer.

If you have attached it to the MINI-MACHINE MONITOR program, you can execute the SYNTACTIC SUM routine by ENTERING (GOTO 9992).

The SYNTACTIC SUM of that program is 5653. If you delete lines 35 and 36, it is 4200.

The SYNTACTIC SUM for the CHECKBOOK program in the July/82 issue is 32445. Unfortunately, the nerd who wrote it made a mistake in line 80 of the program where B\$(2) should be B\$(1). It's really degrading having to work with some people !!!

The listed programs in the SYNCHRO-SETTE magazine will have their SYNTACTIC SUMS listed from now on. If any of you are submitting listed programs in the future, include the SYNTACTIC SUM with your listing.

For your homework, I want you to find the SYNTACTIC SUM of the SYNTACTIC SUM routine. Class dismissed.





#### NEW CASSETTE LOADING FORMAT

You probably have noticed by now the LOADER programs that start off each side of this month's cassette we sent you - also the self-running programs. We hope this eases loading of the programs for you and would appreciate any response in this area, be it positive or negative. We will keep this format on each cassette, along with the 16K BULLETIN-BOARD program.

We had received a lot of positive feedback from our subscribers regarding the MARQUEE programs and decided this would be a good way to present messages.

#### ZX 99 TAPE CONTROL SYSTEM

DATA-ASETTE is offering a control system that allows the ZX-81 to control up to four different tape recorders through keyboard or program commands.

It contains its own 2K ROM that acts as an extension to the ZX ROM and contains the tape operating system that gives the ZX performance similar to a

disk operating system but at the speed of the cassette recorders.

If this device was connected to the STRINGY-FLOPPY continuous loop cassette recorders now being marketed by CAI Instruments, the user would have control of an extremely fast data retrieval system.

The ZX-99 also allows direct connection to any industry standard ASCII Character Code. List price is \$150.

Also available are two keyboards with raised push-button keys. One is full size with enclosure. The other is mini-size and attaches to the keyboard to simply make the ZX-81 a machine with raised keys. Both sell for \$75.

Data-asette is also selling RAM Packs - 16K - 59.95, 32K - 119.95 and 64K - 179.95. For further information, contact:

Data-asette  
56 South 3rd St.  
Oxford, PA, 19363

## T/S-1000 NOW BEING SOLD IN U.S.

Macy's in New York is now selling the Timex/Sinclair computers across the counter. Timex, so far, is shipping the computers and about 12 of their advertised 21 software packages.

Timex software packages are:

1. THE BUDGETER	15.95
2. LOAN/MORTGAGE AMORTIZER	14.95
3. CHECKBOOK MANAGER	15.95
4. COUPON MANAGER	12.95
5. CAR POOLER	14.95
6. STAMP COLLECTOR	16.95
7. STOCK OPTION ANALYZER	16.95
8. VU-CALC	19.95
9. INVENTORY CONTROL	19.95
10. MANUFACTURING CONTROL	19.95
11. CRITICAL PATH ANALYSIS	19.95
12. STATISTICS (2K)	9.95
13. STATES & CAPITALS	12.95
14. FLIGHT SIMULATOR	19.95
15. CHESS & CHESS CLOCK	14.95
16. BACKGAMMON & DICE	14.95
17. THE GAMBLER	14.95
18. THE CUBE GAME	12.95
19. GRIMM'S FAIRY TALES	14.95
20. MIXED GAME BAG(3 games)	9.95
21. SUPER MATH	14.95

All of these packages require 16K, except #12. No word about the RAM Packs and other add-on devices as of yet. Expect a big advertising campaign to begin sometime between now and the holiday season.

By the way, a 2K starter cassette comes with each T/S computer. It contains 3 programs. My mini-review is as follows:

**LIFE** - A machine language program that simulates the generation of living cells through the process of birth, death and regeneration. ~~Now~~ I've never played the game before, I had trouble understanding the rules and when I was able to display the cells, they wouldn't generate when I entered the "G" command. Maybe I need more work on this one but another T/S-1000 owner couldn't get it to work either.

**MATH** - This one I did get to work and it is the best and easiest to

use of the bunch. This program tests the user's abilities in addition, subtraction, multiplication and division with 4 difficulty levels. It is well written and easy to understand.

**AVERAGES** - The program is designed to help you understand the concepts of MEAN and MEDIAN and draw a bar chart to visualize the information. Suggested inputs range from sales to shoe sizes.

## OUTSIDE SOFTWARE SUPPORT TO BE SOLD THROUGH STORES

A company, tentatively to be called SYSTEM 2000, is planning to have available software for the T/S-1000 through many of the stores that will be selling the computers. This is in addition to Timex's software.

I have seen some of the programs and they are professionally done and well documented. RAIDERS OF THE LOST TOMB is an adventure-type game that emphasizes heavy graphics. BUDGET will help the user in structuring bill paying methods and allow entries in at least 25 categories.

SYSTEM-2000 plans to have available both 16K and 2K software. Timex has primarily 16K software at this time. An advance press release listed the following software:

1. HOME/BUS. BUDGET	14.95
2. ROBBERS/TOMB	14.95
3. GOLF SCORE ANALY.	14.95
4. FINANCIAL ANALY.	14.95
5. LAS VEGAS GAMES	14.95
6. SPACE GAMES	14.95
7. HOME LEARNING SYS.	10.95
8. STAR BATTLE	12.95
9. HOME INSURANCE INV.	12.95
10. CPM/PERT	14.95
11. 2K-5 GAME PACK	N/A
12. BIORHYTHM/ORACLE	N/A

If you cannot find the SYSTEM-2000 software in your area, you will be able to order it from us.

(cont. on page 2)



## LETTERS TO THE EDITOR

Dear Ed,

The following is a tutorial that I gave my users' group at our last meeting. I think it would be a good way to have your MARQUEE program run. I haven't found any problems with this method as of yet, but Murphy says that there must be one.

### LOAD & RUN PROGRAM

```
5 REM LOAD & RUN
7 REM TO SAVE THIS PROGRAM-
8 REM TYPE "RUN 40"<ENTER>
10 PRINT "THIS PROGRAM IS NOW
    RUNNING"
15 SCROLL
20 GOTO 10
30 STOP
40 SAVE "LOAD AND RUN"
50 RUN 5
```

After entering the program, RUN it to verify that it does run. BREAK the program, set up the recorder for recording and enter RUN 40. After the program has been saved, it will automatically start running.

Rewind the tape and enter LOAD". After the program has loaded, it will automatically start running. The key to having a program start running as soon as it is loaded lies in lines 40 & 50. The commands in those lines may occur anywhere in the program as long as the program execution does not enter those lines. It is best to have a STOP command precede those lines just for safety.

If variables are to be saved and then loaded with the program, GOTO commands should be substituted for the RUN commands. To the LOAD & SAVE program, make the following changes:

5 - add "WITH SAVED VARIABLES"

```
8 - change RUN to GOTO
40 - add "WITH SAVED VARIABLES"
50 - change RUN to GOTO
Add line -12 PRINT A$
```

In the immediate mode, type "LET A\$ = "THIS IS A SAVED VARIABLE STRING"

Now type "GOTO 40", start the tape recorder and hit enter. After it has been saved, the program will start running. STOP it and enter NEW. Rewind the tape and type LOAD " and start the tape. When the tape is loaded, you will see it running with the added message that doesn't appear in the listing.

About the MARQUEE program - I really like it and plan to use it for a display at the next meeting.

I would like to see a tutorial on the trig functions and their use with the PLOT function.

Thank you for a great magazine.

Jim Wallace N3ADF  
P6-ZUG  
Prince George's Sinclair  
Users' Group  
5448 Tilden Rd.  
Bladensburg, MD, 20710

\* Thanks for the great tutorial, Jim. This procedure is somewhat covered on page 80 of the Sinclair manual, but like many people, I'm the type of guy that "when all else fails, read the instructions".

As you can see, I put your hints to good use on some of this month's programs and found them especially valuable in a

menu-driven program that stores and retrieves files. I'm sure most of our readers feel the same - Ed.

---

Dear Ed.

I have now take delivery of my 48K ZX SPECTRUM. After the initial euphoria, I have taken stock and consider it to be a superb machine. Using it with a small screen colour TV is really something and I can heartily recommend the purchase of one of these when they become available over there.

Much of the BASIC is, of course, directly compatible with ZX-81 BASIC but often on different keys one spends quite a while correcting typing errors caused by a long familiarity with the ZX-81 layout. One problem for me, at the moment, is machine code, particularly where ZX-81 routines call subroutines from the 8K ROM. They do not work on the SPECTRUM. So until someone more clever than I produces the disassembled 16K ROM, I shall have to stick to SPECTRUM BASIC, which is quite fast.

My greatest delight is the LOAD/SAVE/VERIFY set-up - very quick indeed, and with colour, one gets a very spectacular display while these functions are operating. A great help is the listing of programs passed through on the cassette while searching for the one you actually specified to be loaded. I have seen something similar on a large PET, but I'm not sure that if any other micros offer this feature. It is certainly a valuable one as far as I'm concerned because one can really store a very large number of SPECTRUM programs on a standard C-60 or C-90 cassette, and it is excellent for the computer to tell me the whereabouts without actually going through the motions of loading each program

along the way.

A point to bear in mind, if you decide to order a SPECTRUM when it becomes available in the U.S., is that the system variables, memory maps, etc., take up approximately 6.5 k of RAM. So unless cost is a key factor, it does not seem worth while buying a 16K version when the larger one is not all that much more expensive, compared to other micros. I remember groaning about the hungry nature of the 8K ROM as opposed to the 4K original. Little did I know what was to come with the 16K ROM !!!

I liked 'MARQUEE-2' and had intended using it to write this letter; however, I decided to use a common old DEC PDP-11 (What ?? only 16K BASIC memory? - chicken feed !!!), mainly because the typing is a bit faster and easier (plus the fact, of course, that one can get more words on a line than with a ZX printer).

I intend adapting some of your programs for the SPECTRUM & will let you know how I get on and if I have been able to perform any improvements (at this stage, the latter seems unlikely !!).

Finally, I am intrigued by the signature on the drawings in SYNCHRO-SETTE. If it is not a rude question, is she the wife, mother, daughter, sister or whatever? Irrespective of the answer, it is nice to see the ladies involved. After all, ZX-ing should not be an all-male preserve, or don't you agree?

Regards

Leslie W. Tyler  
Cheltenham, England

\* Actually, Marilyn is my brother. Mom and Dad had a strange sense of humor, bless 'em - Ed.